



MATHS

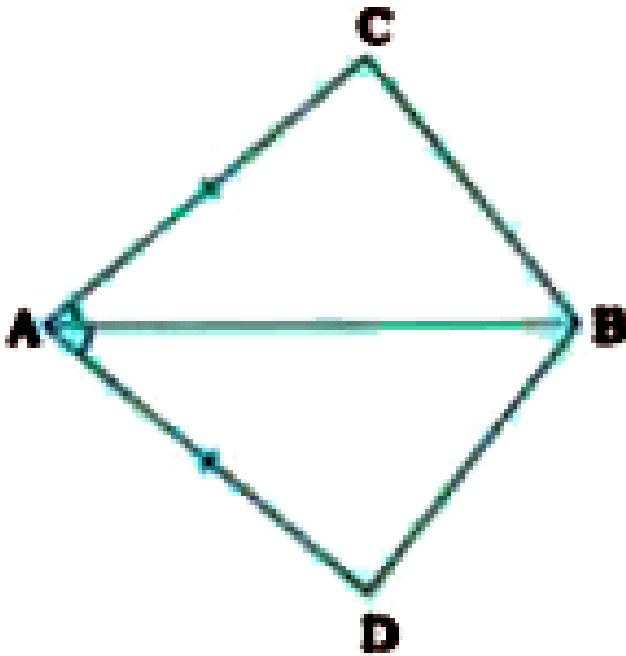
BOOKS - KUMAR PRAKASHAN KENDRA MATHS (GUJRATI ENGLISH)

TRIANGLES

Exercise 7 1

1. In quadrilateral ACBD. $AC = AD$ and AB bisects $\angle A$ (see the given figure). Show that $\triangle ABC = \triangle ABD$. What can you

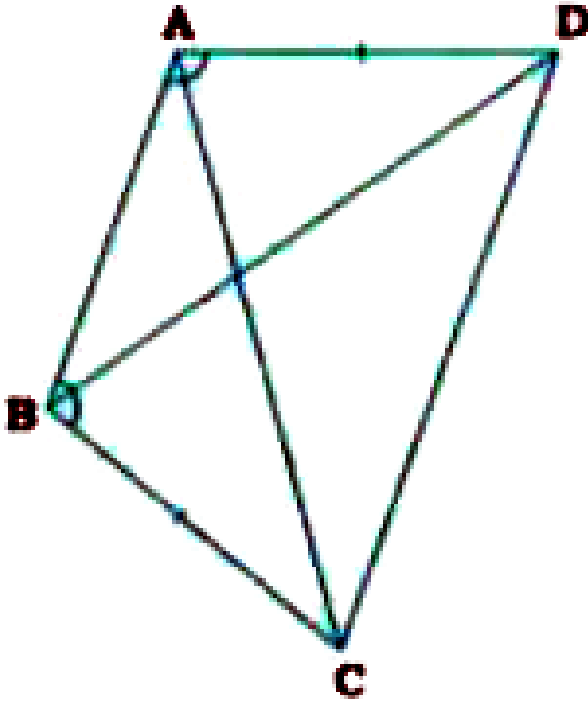
say about BC and BD?



Watch Video Solution

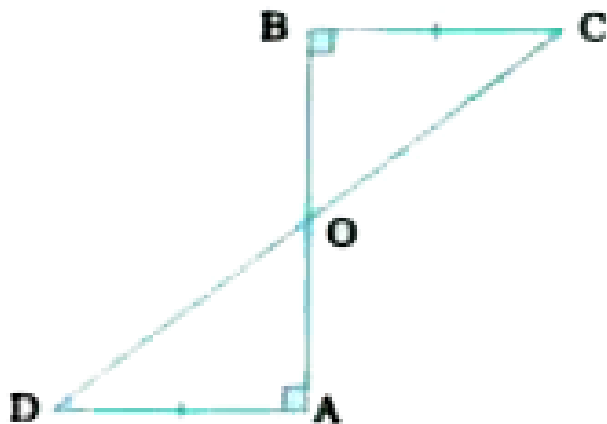
2. ABCD is a quadrilateral in which $AD = BC$ and $\angle DAB = \angle CBA$ (see the given figure). Prove that (i)

$\triangle ABD = \triangle BAC$, (ii) $BD = AC$ and (iii) $\angle ABD = \angle BAC$



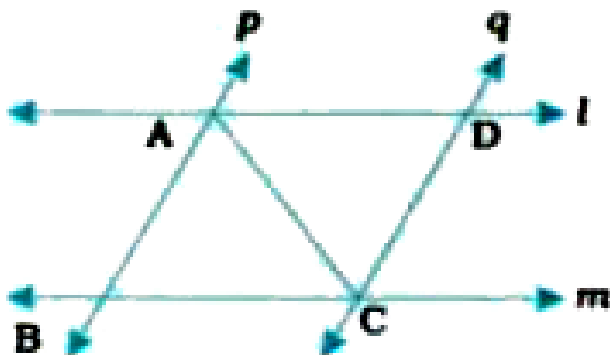
Watch Video Solution

3. AD and BC are equal perpendiculars to a line segment AB (see the given figure) Show that CD bisects AB.



 Watch Video Solution

4. l and m are two parallel lines intersected by another pair of parallel lines p and q and show that $\triangle ABC = \triangle CDA$

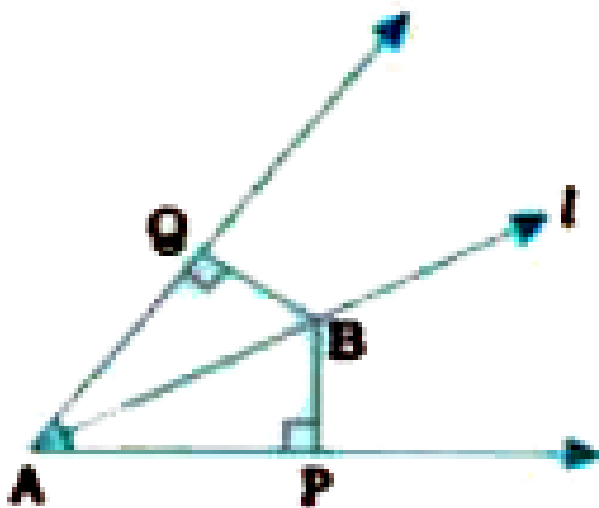


 Watch Video Solution

5. Ray 1 is the bisector of an angle $\angle A$ and B is any point on l. BP and BQ are perpendiculars from B to the arms of $\angle A$ (see the given figure). Show that:

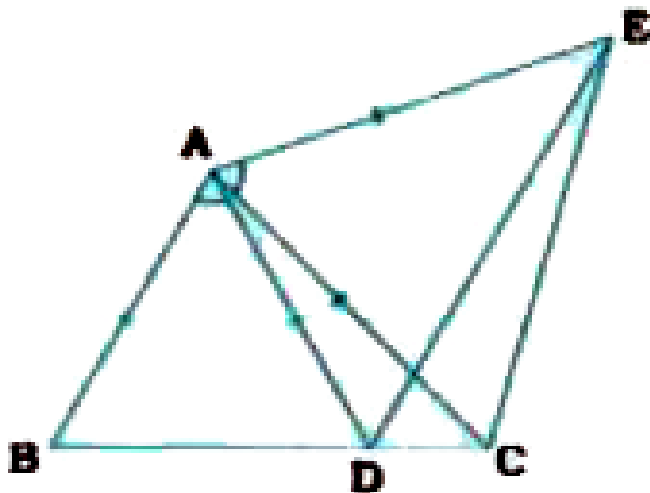
(i) $\triangle APB = \triangle AQB$

(ii) $BP = BQ$ or B is equidistant from the arms of $\angle A$



6. In the given figure, $AC = AE$, $AB = AD$ and $\angle BAD = \angle EAC$.

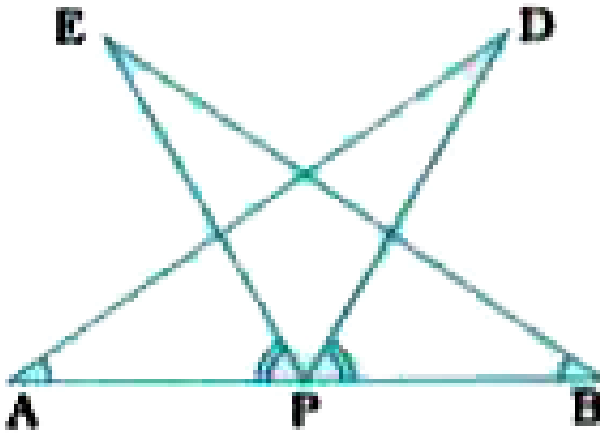
Show that $BC = DE$.



Watch Video Solution

7. AB is a line segment and P is its midpoint. D and E are points on the same side of AB such that $\angle BAD = \angle ABE$ and $\angle EPA = \angle DPB$ (see the given

figure). Show that:



[Watch Video Solution](#)

8. In right triangle ABC , right angled at C , M is the midpoint of hypotenuse AB . C is joined to M and produced to a point D such that $DM = CM$. Point D is joined to point B (see the given figure).

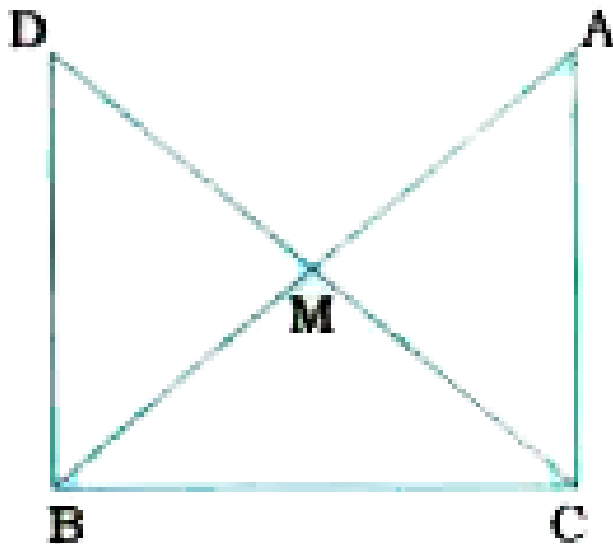
Show that:

(i) $\triangle AMC = \triangle BMD$

(ii) $\angle DBC$ is a right angle

(iii) $\triangle DBC = \triangle ACB$

(iv) $CM = \frac{1}{2} AB$

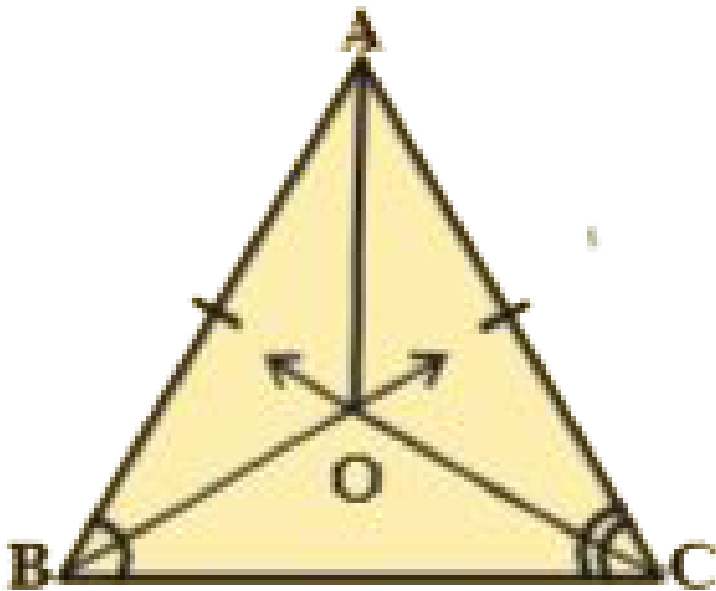


Watch Video Solution

Exercise 7 2

1. In an isosceles triangle ABC, with $AB = AC$, the bisectors of $\angle B$ and $\angle C$ intersect each other at O. Join A to O. Show that :

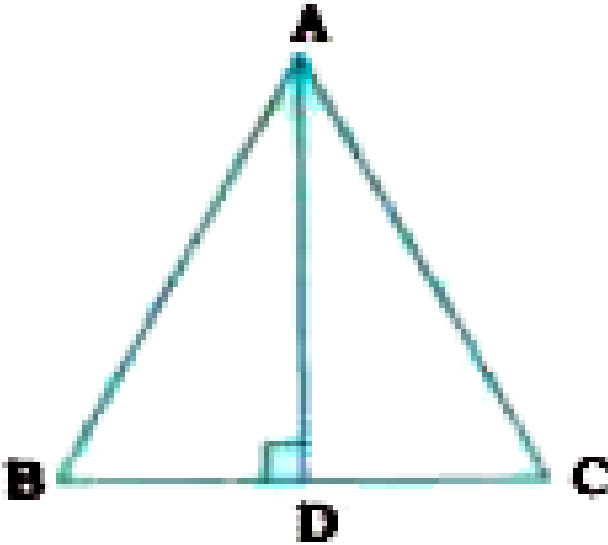
(i) $OB = OC$ (ii) AO bisects $\angle A$



[Watch Video Solution](#)

2. In $\triangle ABC$, AD is the perpendicular bisector of BC (see the given figure). Show that $\triangle ABC$ is an isosceles triangle in

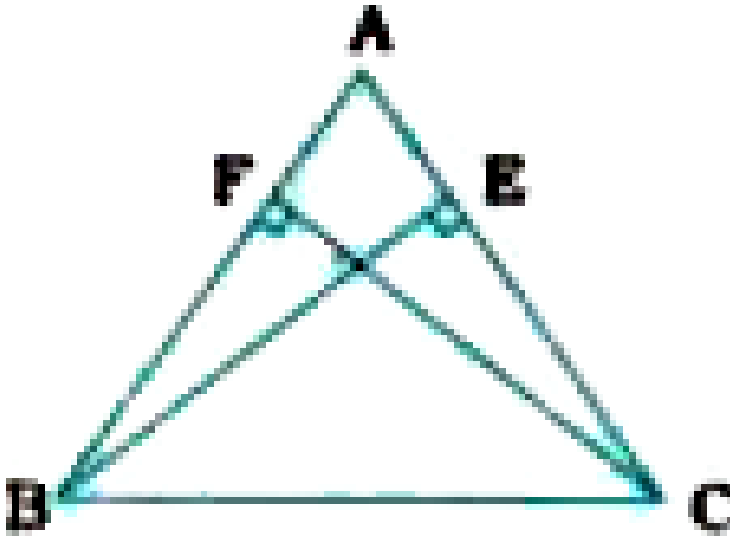
which $AB = AC$



Watch Video Solution

3. ABC is an isosceles triangle in which altitudes BE and CF are drawn to equal sides AC and AB respectively (see the given

figure). Show that these altitudes are equal.

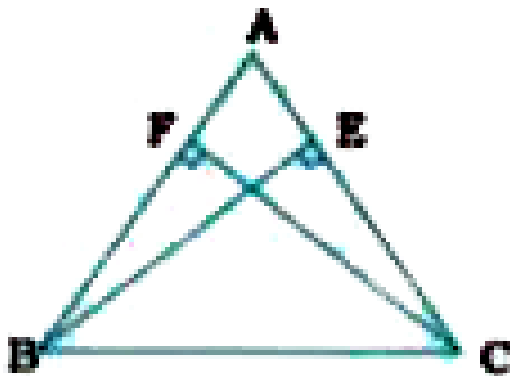


Watch Video Solution

4. ABC is a triangle in which altitudes BE and CF to sides AC and AB are equal (see the given figure). Show that (i)

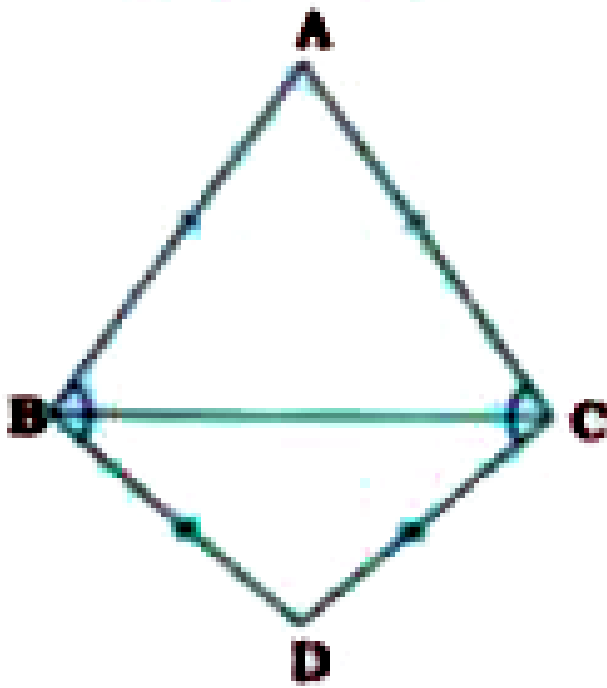
$$\triangle ABE \cong \triangle ACF$$

(ii) $AB = AC$ i.e. ABC is an isosceles triangle



Watch Video Solution

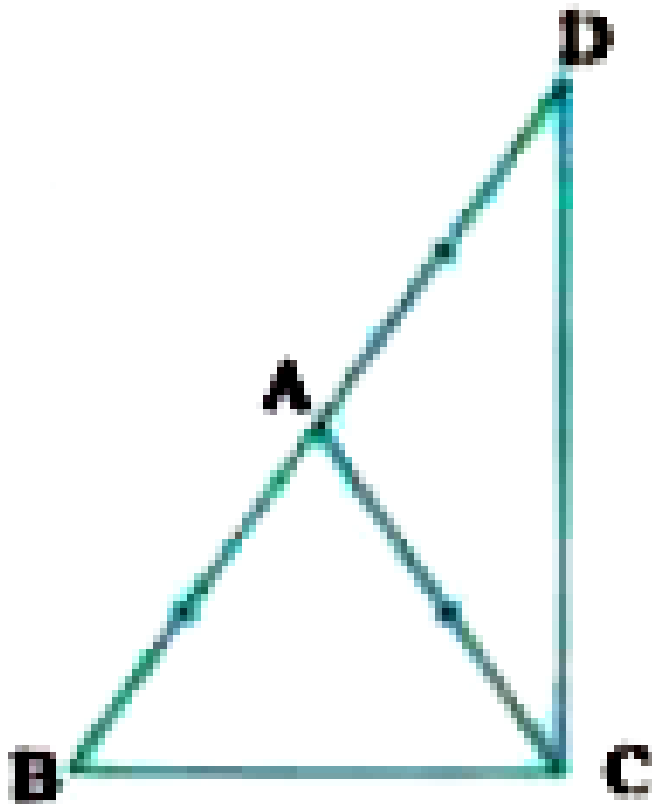
5. ABC and DBC are two isosceles triangles on the same base BC (see the given figure). Show that $\angle ABD = \angle ACD$.



Watch Video Solution

6. $\triangle ABC$ is an isosceles triangle in which $AB = AC$. Side BA is produced to D such that $AD = AB$ (see the given figure). Show

that $\angle BCD$ is a right angle.



Watch Video Solution

7. ABC is a right angled triangle in which $\angle A = 90^\circ$ and $AB = AC$. Find $\angle B$ and $\angle C$.



Watch Video Solution

8. Show that the angles of an triangle are 60° each.

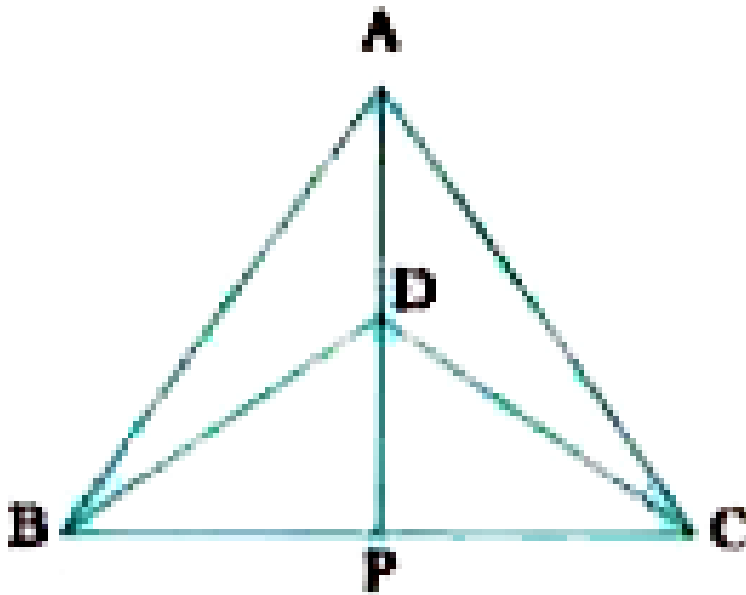


Watch Video Solution

Exercise 7 3

1. $\triangle ABC$ and $\triangle DBC$ are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC (see the given figure). If AD is extended to intersect BC at P , show that, (i) $\triangle ABD = \triangle ACD$ (ii) $\triangle ABP = \triangle ACP$ (iii) AP bisects $\angle A$ as well as $\angle D$. (iv) AP is the perpendicular

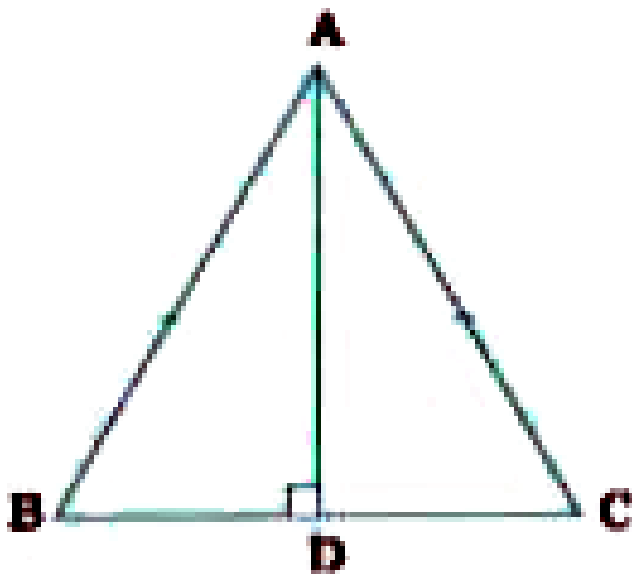
bisector of BC



Watch Video Solution

2. AD is an altitude of an isosceles triangle ABC in which $AB = AC$.

Show that: (i) AD bisects BC (ii) AD bisects $\angle A$

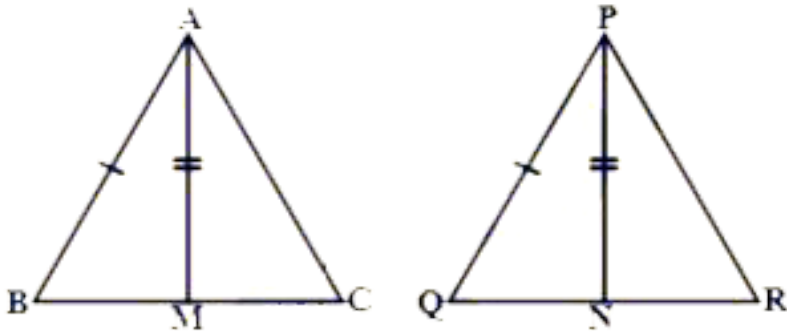


 Watch Video Solution

3. Two sides AB, BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of $\triangle PQR$ (See figure). Show that:

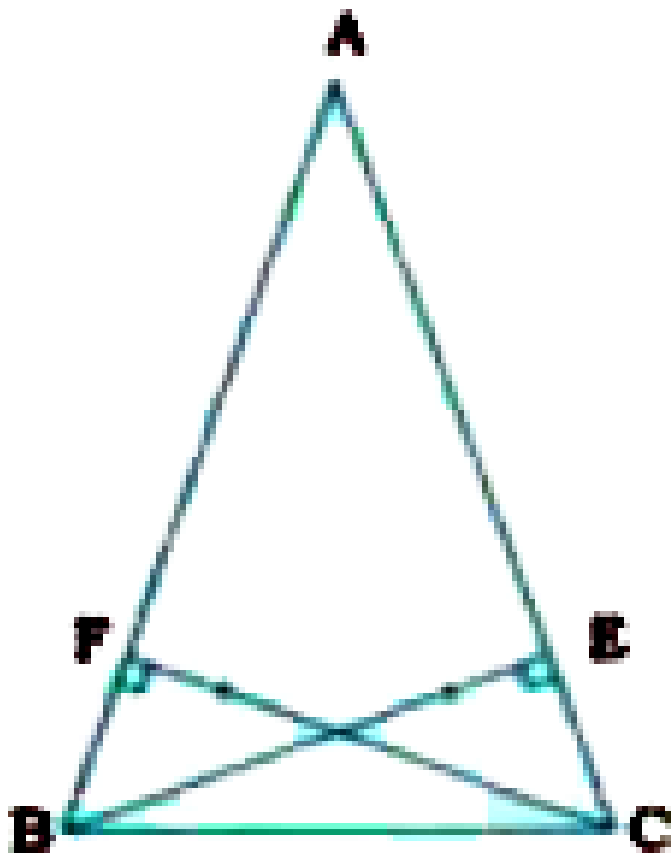
(i) $\triangle ABM \cong \triangle PQN$

(ii) $\triangle ABC \cong \triangle PQR$



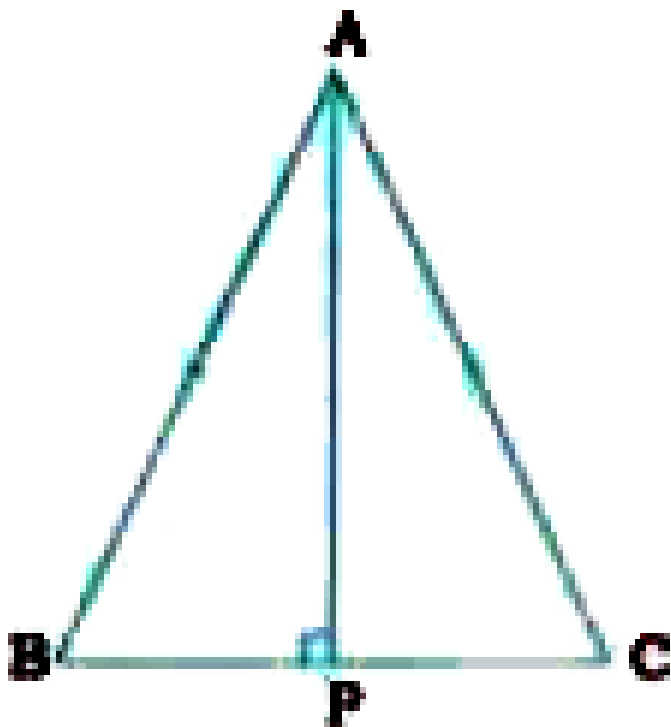
Watch Video Solution

4. BE and CF are two equal altitudes of a triangle ABC . Using RHS congruence rule, prove that the triangle ABC is isosceles.



Watch Video Solution

5. ABC is an isosceles triangle with $AB = AC$. Draw $AP \perp BC$ to show that $\angle B = \angle C$



 Watch Video Solution

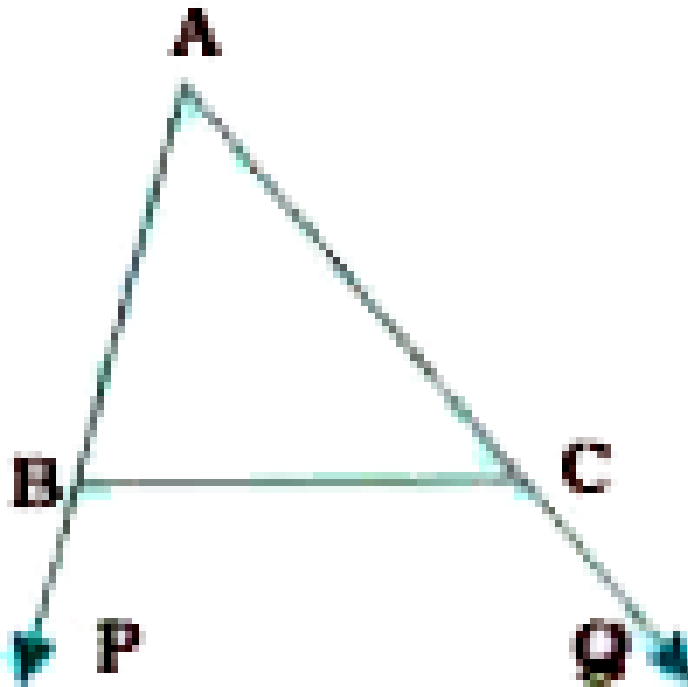
Exercise 7 4

1. Show that in a right angled triangle, the hypotenuse is the longest side.



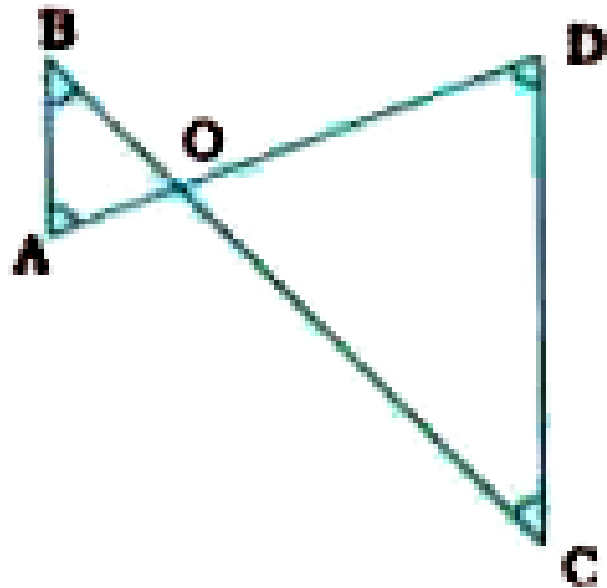
Watch Video Solution

2. In the given figure, sides AB and AC of $\triangle ABC$ are extended to points P and Q respectively. Also, $\angle PBC < \angle QCB$. Show that $AC > AB$



Watch Video Solution

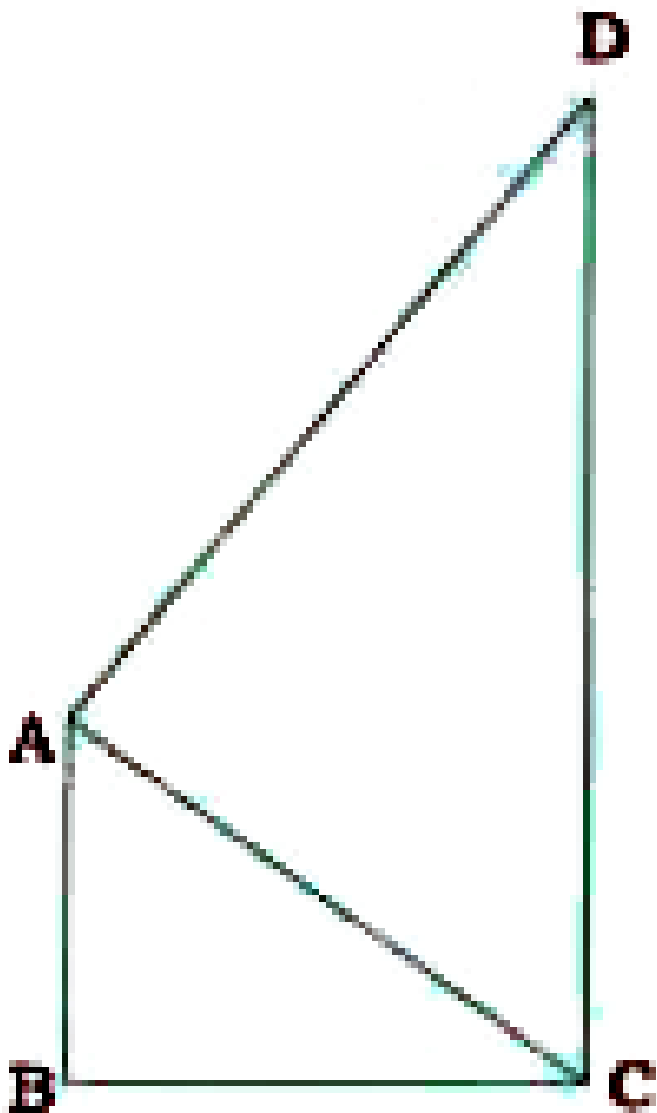
3. In the given figure, $\angle B < \angle A$ and $\angle C < \angle D$. Show that $AD < BC$.



Watch Video Solution

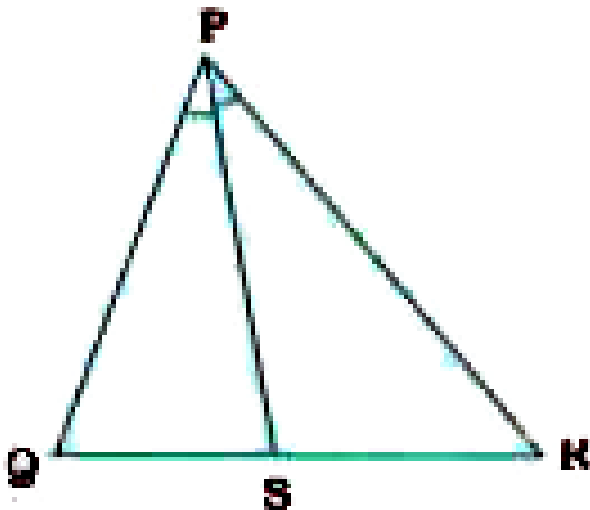
4. AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD (see the given figure). Show that $\angle A > \angle C$

and $\angle B > \angle D$



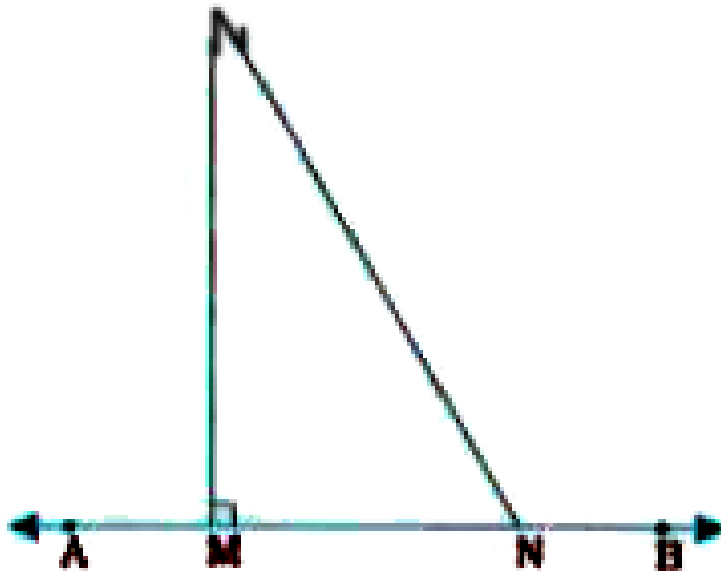
Watch Video Solution

5. In the given figure, $PR > PQ$ and PS bisects $\angle QPR$. Prove that $\angle PSR > \angle PSQ$.



Watch Video Solution

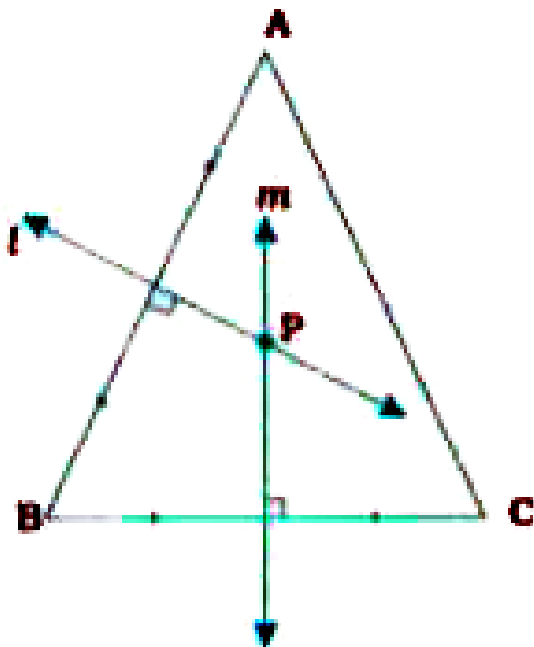
6. Show that of all line segments drawn from a given point not on a given line, the perpendicular line segment is the shortest.



Watch Video Solution

Exercise 7 5

1. $\triangle ABC$ is a triangle. Locate a point in the interior of $\triangle ABC$ which is equidistant from all the vertices of $\triangle ABC$



[Watch Video Solution](#)

2. If the lengths of sides of right angled triangle are in A.P then the sines of the acute angles are

[Watch Video Solution](#)

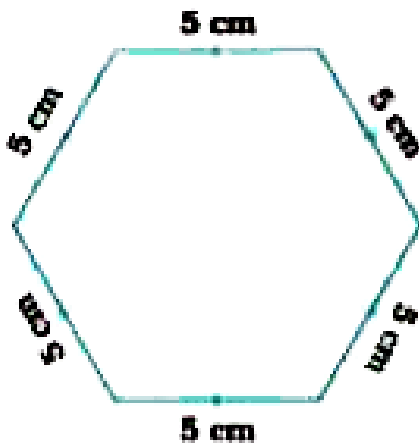
3. In a huge park, people are concentrated at three A points (see the given figure): A : where there are different slides and swings for children. B : near which a manmade lake is situated. C : which is near to a large parking and exit. Where should an ice cream parlour be set up so that maximum number of persons can approach it



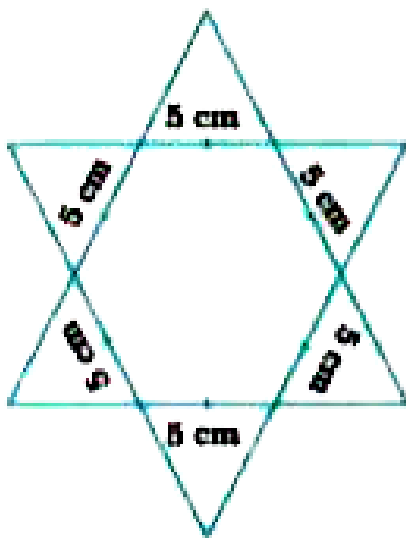
View Text Solution

4. Complete the hexagonal and star shaped Rangolies [see figure (1) and (2) by filling them with as many equilateral triangles of side 1 cm as you can. Count the number of triangles

in each case. Which has more triangles ?



(1)



(2)

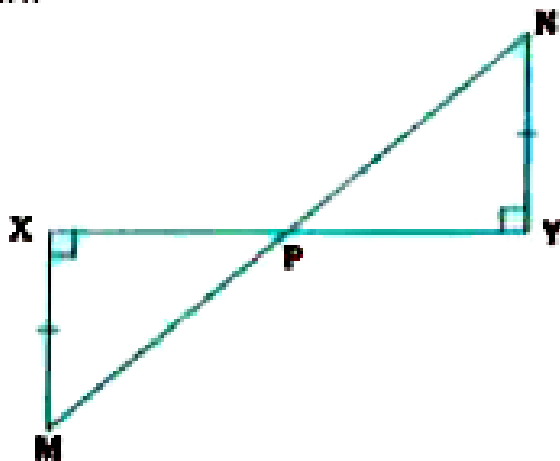


Watch Video Solution

Skill Testing Exercise

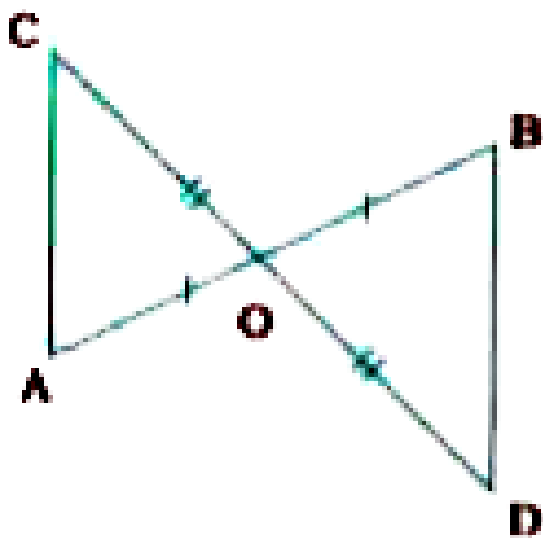
1. In the given figure, XM and YN are both \perp perpendicular to line segment XY and $XM = YN$. 4 Prove that P is the midpoint of XY as well as MN .

as MN .



Watch Video Solution

2. In the given figure AB and CD bisect each other at O . Prove that $AC = BD$.



Watch Video Solution

3. In rectangle ABCD, E is the midpoint of side BC. Prove that, $AE = DE$.



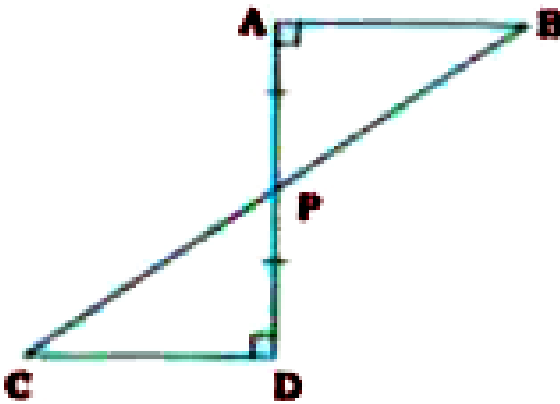
Watch Video Solution

4. Prove that the medians of an equilateral triangle are equal.



Watch Video Solution

5. In the given figure, AB and DC are both perpendicular to line segment AD . BC intersects AD at P and P is the midpoint of AD . Prove that, (1) $AB = CD$ (2) P is the midpoint of BC .



6. In $\triangle ABC$, $AB = AC$ and the bisector of $\angle A$ intersects BC at D . Prove that, (1) $\triangle ADB = \triangle ADC$ (2) $\angle ABC = \angle ACB$

[Watch Video Solution](#)

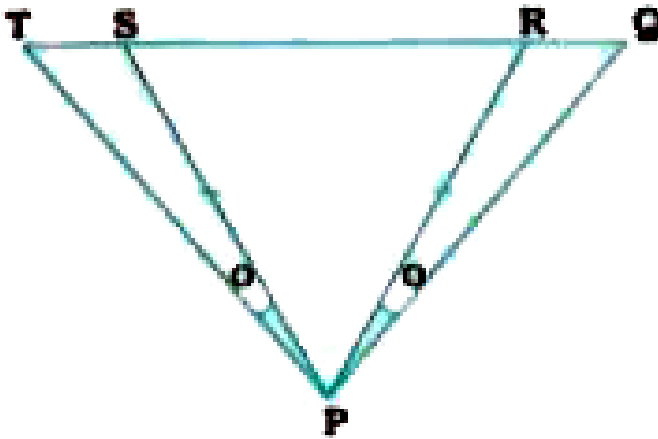
7. In $\triangle ABC$, the bisectors of $\angle B$ and $\angle C$ intersect at I . A line drawn through I and parallel to BC intersects AB at P and AC at Q . Prove that $PQ = BP + CQ$.

[Watch Video Solution](#)

8. In $\triangle ABC$, $AB = AC$ and $\angle A = 36^\circ$. The bisector of $\angle C$ intersects AB at D . Find the measures of required angles to prove that $AD = BC$

[Watch Video Solution](#)

9. In the given figure, $PS = PR$ and $\angle TPS = \angle QPR$. Prove that $PT = PQ$.



Watch Video Solution

10. In $\triangle ABC$, D is the midpoint of BC. $DF \perp AB$ and $DE \perp AC$, where points F and E lie on AB and AC respectively. If $DF = DE$, prove that $\triangle ABC$ is an isosceles triangle.



Watch Video Solution

11. In parallelogram ABCD, diagonals AC and BD are equal. Find the measure of $\angle ABC$ and prove that the quadrilateral ABCD is a rectangle.



[Watch Video Solution](#)

12. $\triangle ABC$ and $\triangle DBC$ are isosceles triangles on the same base BC. Prove that line AD bisects BC at right angles



[Watch Video Solution](#)

13. AD, BE and CF are altitudes of $\triangle ABC$. If $AD = BE = CF$, prove that $\triangle ABC$ is an equilateral triangle.



[Watch Video Solution](#)

14. In quadrilateral ABCD, $BA = BC$ and $DA = DC$. Prove that BD bisects $\angle ABC$ as well as $\angle ADC$.



Watch Video Solution

15. In $\triangle ABC$, $AB > AC$ and D is any point of BC. Prove that, $AB > AD$.



Watch Video Solution

16. In $\triangle ABC$, $AC > AB$. AB is extended to P and AC is extended to Q. Prove that, $\angle PBC < \angle QCB$.



Watch Video Solution

17. In $\triangle ABC$, AD, BE and CF are altitudes. Prove I, that,
 $AD + BE + CF < AB + BC + CA$



Watch Video Solution

18. Point S lies in the interior of A PQR. Prove that, $SQ + SR < PQ + PR$.



Watch Video Solution

19. In $\triangle ABC$, AD is a median. Prove that $AB + AC > 2AD$



Watch Video Solution

20. For any triangle, prove that the sum of the sides of the triangle is greater than the sum of the medians of the triangle.



Watch Video Solution

Multiple Choice Questions

1. In $\triangle ABC$, $\angle A = \angle C$, $AC = 5$ and $BC = 4$. Then, the perimeter of $\triangle ABC$ is

A. 9

B. 14

C. 13

D. 15

Answer: A::C



Watch Video Solution

2. In $\triangle PQR$, $PQ = PR$, QR is extended to S and $\angle PRS = 110^\circ$.

Then, $\angle PQR = \dots\dots\dots$

A. 30°

B. 50°

C. 80°

D. 70°

Answer:



Watch Video Solution

3. In $\triangle ABC$ and $\triangle DEF$, $AB = DE$, $BC = EF$ and $\angle B = \angle E$. If the perimeter of $\triangle ABC$ is 20, then the perimeter of $\triangle DEF$ is

.....

A. 10

B. 20

C. 15

D. 40

Answer: B



Watch Video Solution

4. In $\triangle ABC$ and $\triangle PQR$, $AB = PQ$, $\angle A = \angle P$ and $\angle B = \angle Q$. If $\angle A + \angle C = 130^\circ$, then $\angle Q =$

A. 65°

B. 130°

C. 50°

D. 100°

Answer:



Watch Video Solution

5. In $\triangle PQR$, $\angle P = \angle Q = \angle R$. If $PQ = 6$, then the perimeter of $\triangle PQR$ is

A. 12

B. 9

C. 18

D. 24

Answer: A



Watch Video Solution

6. In $\angle ABC$, $AB < AC$. Then, holds good

A. $\angle A < \angle B$

B. $\angle B < \angle C$

C. $\angle C < \angle A$

D. $\angle C < \angle B$

Answer: A::B::C



Watch Video Solution

7. In $\triangle PQR$, $\angle R > \angle Q$. Then..... holds good.

A. $PQ > PR$

B. $QR > PQ$

C. $PR < PQ$

D. $PQ > QR$

Answer:



Watch Video Solution

8. In $\triangle ABC$, $AB > BC$ and $BC > AC$. Then, the smallest angle of $\triangle ABC$ is

A. $\angle A$

B. $\angle C$

C. $\angle B$

D. $\angle A$ or $\angle C$

Answer: A::B



Watch Video Solution

9. cannot be the measures of the sides of a triangle.

A. 10,12,14

B. 2,3,4

C. 8,9,10

D. 2,4,10

Answer: A::B::D



Watch Video Solution

10. In $\triangle PQR$, $PQ = 4$, $QR = 6$ and $PR = 5$. Then, is the angle with greatest measure in $\triangle PQR$.

A. $\angle P$

B. $\angle Q$

C. $\angle R$

D. $\angle QPR$

Answer: A



Watch Video Solution

11. In $\triangle XYZ$, $\angle X = 45^\circ$ and $\angle Z = 60^\circ$. Then, is the longest side of $\triangle XYZ$.

A. XY

B. YZ

C. XZ

D. XY or YZ

Answer:



Watch Video Solution

12. BC

A. AB

B. BC

C. CA

D. AB or AC

Answer: B::C



View Text Solution

13. In $\triangle ABC$, $AB = 4$ holds good.

A. $AC < 7$

B. $AC > 4$

C. $4 < AC < 7$

D. $3 < AC < 11$

Answer: A::C



View Text Solution

14. In $\triangle PQR$, $PQ = 3$ and $QR = 7$ Thenholds good.

A. $PR=4$

B. $PR=10$

C. $10 > PR > 4$

D. $7 > PR > 3$

Answer: A::D



Watch Video Solution

15. In $\triangle ABC$ the bisectors of $\angle B$ and $\angle C$ intersect at I if $\angle A = 70^\circ$ then $\angle BIC = \dots\dots\dots$

A. 35°

B. 75°

C. 100°

D. 125°

Answer: A::B

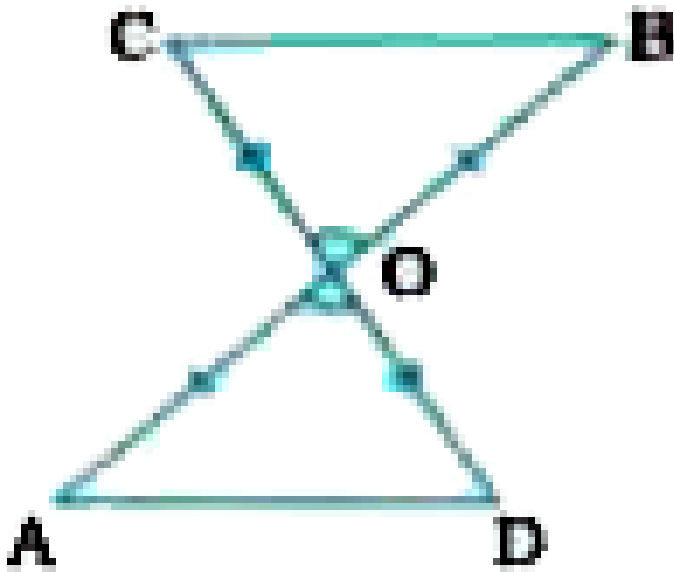


Watch Video Solution

Sums To Enrich Remember

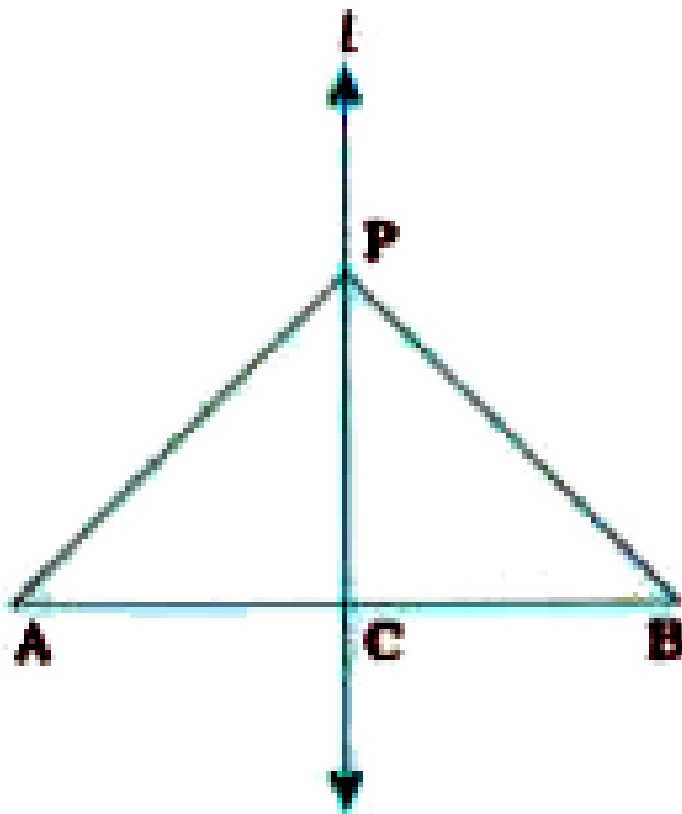
1. In the given figures, $OA = OB$ and $OD = OC$. Show that

(i) $\triangle AOD = \triangle BOC$ and (ii) $AD \parallel BC$



Watch Video Solution

2. AB is a line segment and line l is its perpendicular bisector. If a point P lies on l , show that P is equidistant from A and B .

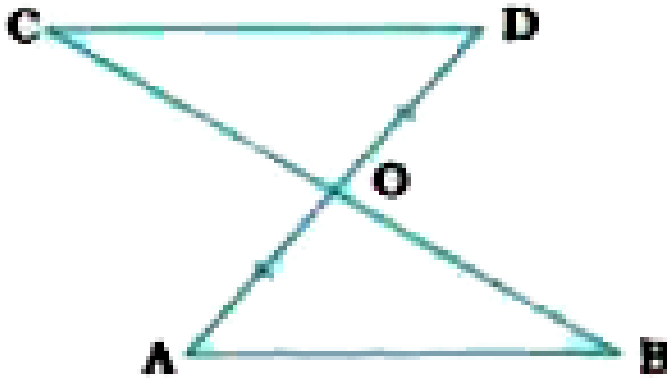


Watch Video Solution

3. Line segment AB is parallel to another line segment CD. O is the midpoint of AD (see the given figure). Show that

(i) $\triangle AOB = \triangle DOC$

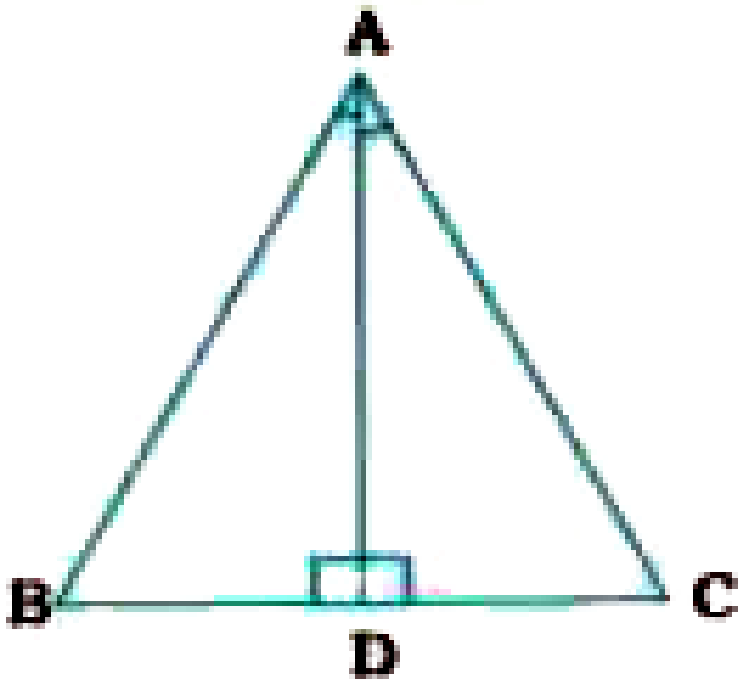
(ii) O is also the midpoint of BC



View Text Solution

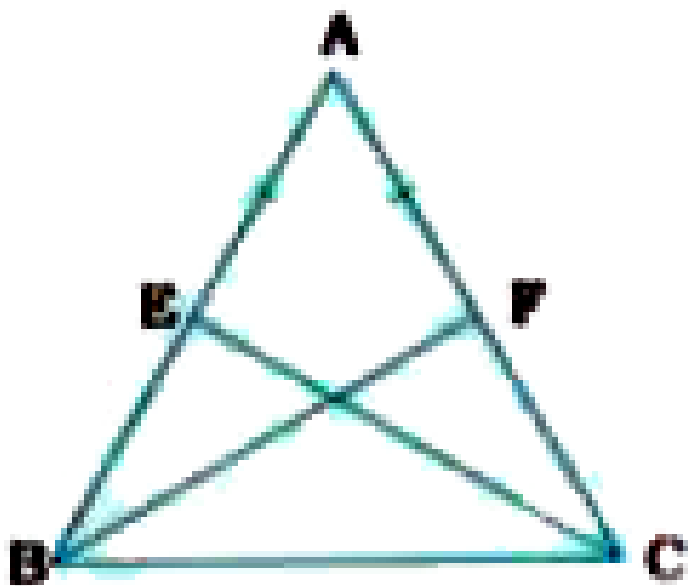
4. In $\triangle ABC$, the bisector AD of $\angle A$ is perpendicular to side BC (see the given figure). Show that $AB = AC$ and $\triangle ABC$ is

isosceles.



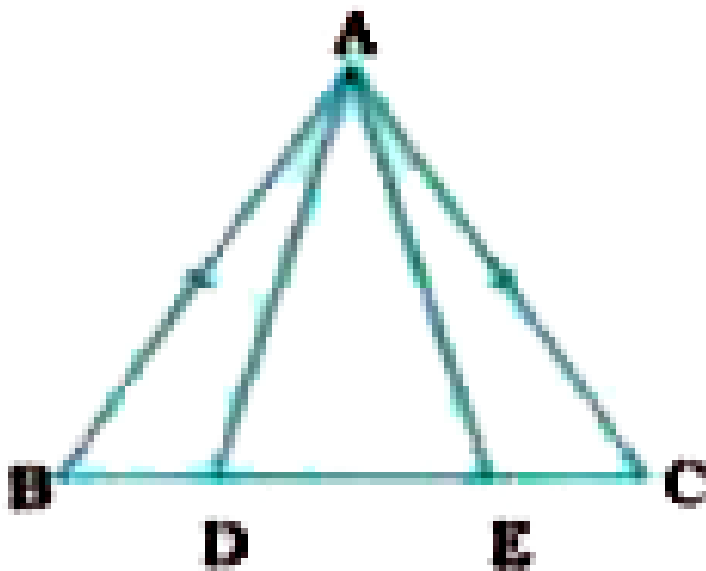
Watch Video Solution

5. E and F are respectively the midpoints of equal sides AB and AC of $\triangle ABC$ (see the given figure). Show that $BF = CE$.



Watch Video Solution

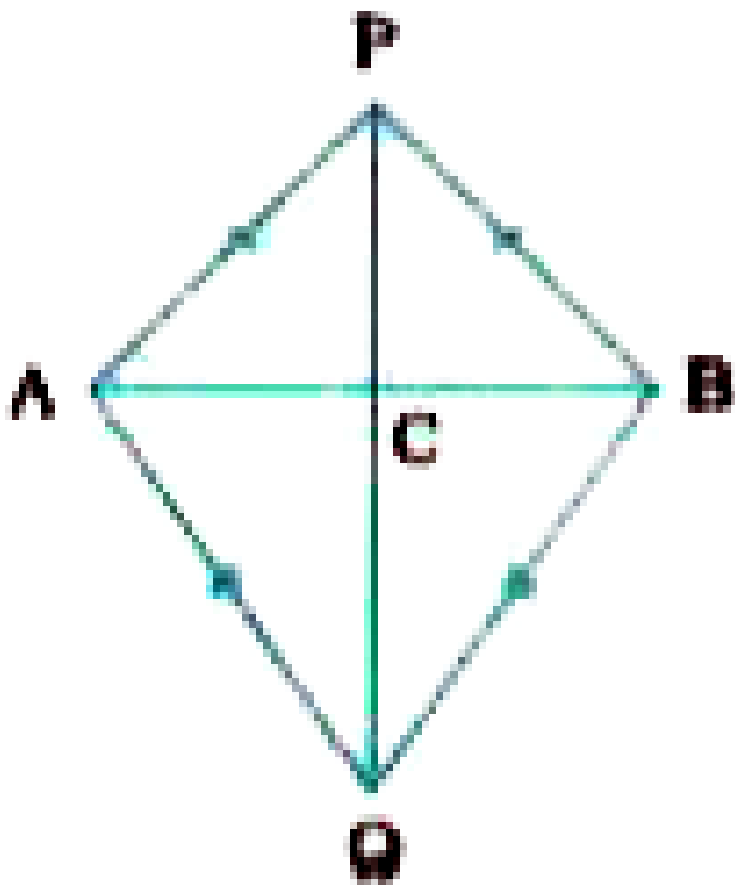
6. In an isosceles triangle ABC with $AB = AC$, D and E are points on BC such that $BE = CD$ (see the given figure). Show that $AD = AE$.



Watch Video Solution

7. AB is a line segment. P and Q are points on opposite sides of AB such that each of them is equidistant from the points A and B (see the given figure). Show that the line PQ is the

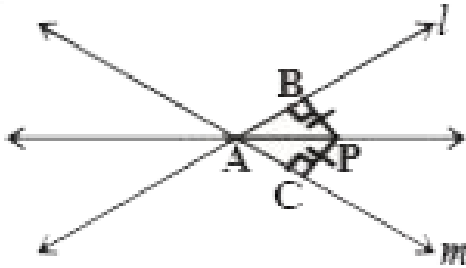
perpendicular bisector of AB.



Watch Video Solution

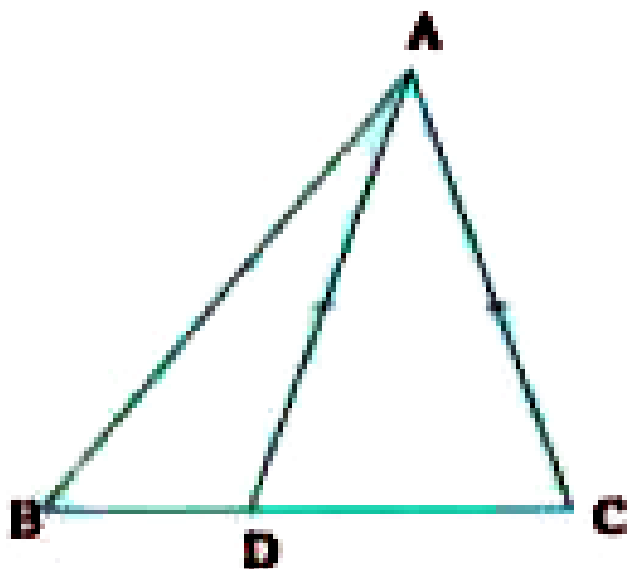
8. P is a point equidistant from two lines l and m intersecting at point A (see figure). Show that the line AP bisects the angle

between them.



Watch Video Solution

9. D is a point on side BC of $\triangle ABC$ such that $AD = AC$ (see the given figure). Show that $AB > AD$.



Watch Video Solution